

**CLAIMS:**

1. A data sonde for use in horizontal directional drilling, the data sonde comprising:
  - a power supply receiving unit adapted to receive either of at least one internal battery and an external power supply cable; and
  - an antenna to emit radiation, wherein the antenna is arranged to receive operative power from the external power supply cable when external power is supplied to the power supply receiving unit through it, and from the internal battery if no external power supply is received at the power supply receiving unit.
2. A data sonde according to claim 1, further comprising control circuitry to control antenna emission.
3. A data sonde according to claim 2, wherein the control circuitry is adapted to control the sonde to emit a secondary signal, said signal comprising information from the sonde.
4. A data sonde according to claim 3, wherein the sonde is adapted to emit the secondary signal through the antenna.
5. A data sonde according to claim 3, wherein the control circuitry is adapted to selectively energise the antenna.
6. A data sonde according to claim 5, wherein the control circuitry is adapted to control the antenna to emit the secondary signal as a DC modulation.
7. A data sonde according to claim 5, wherein the sonde is adapted to output the secondary signal through the power supply receiving unit when an external power supply is connected through the power supply receiving unit.

8. A data sonde according to claim 7, wherein the secondary signal is transmitted through the power supply receiving unit in the form of the DC power, current or voltage drawn by the sonde.
9. A data sonde according to claim 8, wherein the secondary signal comprises data relating to one or more parameters chosen from the group comprising: pitch; azimuth angle; yaw; speed of drilling; battery consumption.
10. A data sonde according to claim 3, wherein the sonde is adapted to emit the secondary signal as a binary signal from the antenna, and also as a binary signal through the power supply receiving unit if an external power supply is received by the power supply receiving unit, by binary modulation of the emission of radiation signal from the antenna.
11. A data sonde according to claim 1, wherein the power supply receiving unit is adapted to alternatively receive an inductive winding to receive radiation emitted by the antenna and output the received signal through the power supply receiving unit.
12. A data sonde for use in horizontal directional drilling, the data sonde comprising:
  - power supply receiving means for receiving a power supply from either of at least one internal battery and an external power supply cable; and
  - emitting means for emitting radiation, and receiving operative power from an external power supply when one is connected to the receiving means, and from a battery if no external power supply is connected to the receiving means.
13. A data sonde according to claim 12, further comprising control means for controlling antenna emission.

14. A data sonde according to claim 12, wherein the emitting means is also for emitting a secondary signal comprising information from the sonde.
15. A data sonde according to claim 14, wherein the sonde comprises secondary signal emitting means for emitting the secondary signal through the antenna.
16. A data sonde according to claim 12, wherein the secondary signal emitting means is for selectively energising the emitting means.
17. A data sonde according to claim 15, wherein the secondary signal emitting means is for emitting the secondary signal as a DC modulation corresponding to the power supplied to the emitting means.
18. A data sonde according to claim 17, wherein the secondary signal emitting means is for outputting the secondary signal from the sonde through the power supply receiving means when the sonde receives an external power supply through the power supply receiving means.
19. A data sonde according to claim 18, wherein the secondary signal is transmitted through the power supply receiving means in the form of the DC power drawn by the sonde.
20. A data sonde according to claim 14, wherein the sonde is adapted to emit the secondary signal as a binary signal from the emitting means, and also as a binary signal through the power supply receiving means if an external power supply is received by the power supply receiving means, by binary modulation of the emission of radiation from the emitting means.
21. A method of transmitting data from a data sonde for use in horizontal directional drilling, the method comprising:

receiving a power supply from one of: an internal battery within the data sonde;  
and an external power supply connected to the sonde;

using the external power supply to power an antenna in the sonde if connected to  
the sonde, and using the internal battery within the data sonde to power an antenna in  
the sonde if no external power supply is connected to the sonde.

22. A method according to claim 21, further comprising passing the power supply  
from the external power supply through the battery, if an external power supply is  
connected to the sonde.

23. A method according to claim 21, wherein the data sonde also emits a secondary  
signal.

24. A method according to claim 23, wherein the sonde emits the secondary signal  
through the antenna.

25. A method according to claim 23, wherein the sonde outputs the secondary signal  
from the sonde through the power supplied to the sonde when the sonde receives an  
external power supply.

26. A method according to claim 23, wherein the sonde selectively energises the  
antenna with a switch.

27. A method according to claim 26, wherein the switch acts as an AC isolator  
between the antenna and the power supplied to the sonde.

28. A method according to claim 26, wherein the sonde emits the secondary signal  
as a DC modulation corresponding to the power supplied to the antenna.

29. A method according to claim 28, wherein the secondary signal comprises data relating to one or more parameters chosen from the group comprising: pitch; azimuth angle; yaw; speed of drilling; battery consumption.

30. A method according to claim 21, wherein the antenna receives operative power from an external power supply cable when one is connected to the sonde, and by a battery housed in the battery housing if no external power supply cable is connected to the sonde.

31. A method according to claim 23, wherein the sonde emits the secondary signal as a binary signal from the antenna, and also as a binary signal through the power supplied to the sonde if an external power supply is received by the sonde, by binary modulation of the emission of radiation from the antenna.

32. A method according to claim 21, wherein the battery housing alternatively receives an inductive winding receiving radiation emitted by the antenna and outputs the received signal through the power supplied to the sonde.

33. A method according to claim 21, further wherein effective impedance of a battery mounted in the battery housing is increased to reduce AC loss in the battery.

34. A method according to claim 21, wherein an antenna winding placed in the sonde emits a radiative signal and antenna circuitry drives the antenna winding, wherein the sonde further selectively bypasses the antenna winding when an external power supply is connected to the sonde.

35. A method of communicating between a data sonde and a remote apparatus physically connected to a power supply, the method comprising:  
selectively energising an antenna of the data sonde with an encoded DC modulation representing data to be transmitted to the remote receiving apparatus;

decoding the data at the remote apparatus from the DC modulation in power consumption of the data sonde corresponding to the DC modulated energising of the data sonde antenna.

36. A system for communicating between a data sonde and a remote apparatus connected by cable power supply, the system comprising:

circuitry to control the energisation of an antenna operably connected to the data sonde with an encoded DC modulation representing data to be transmitted to the remote receiving apparatus;

a detector at the remote apparatus to detect the data for output at the remote apparatus from the DC modulation in base band power consumption of the data sonde corresponding to the DC modulated energising of the data sonde antenna.

37. A system for communicating between a data sonde and a remote apparatus connected by a cable power supply, the system comprising:

antenna control means for selectively energising an antenna of the data sonde with an encoded DC modulation representing data to be transmitted to the remote receiving apparatus;

detecting means for detecting the data for output at the remote apparatus from the DC modulation in base band power consumption of the data sonde corresponding to the DC modulated energising of the data sonde antenna.